

NAME:
BLOCK:

TESTING FOR ACIDS AND BASES

PURPOSE: (1) To discover the properties of acids and bases
(2) To develop methods for identifying acids and bases
(3) To classify unknown solutions as acids or bases

MATERIALS:

APPARATUS

1 microplate
safety goggles
various acid/base
indicators
(1) phenolphthalein
(2) bromothymol blue
(3) red litmus paper
(4) blue litmus paper
(5) universal indicator

REAGENTS

Part 1 : (a) dilute HCl solution
(b) dilute NaOH solution

Part 2: (a) six unknown solutions (A – F)

Part 3: (a) 10 household solutions (will be
provided by teacher)

PROCEDURE:

PART 1 : AN ACID AND A BASE

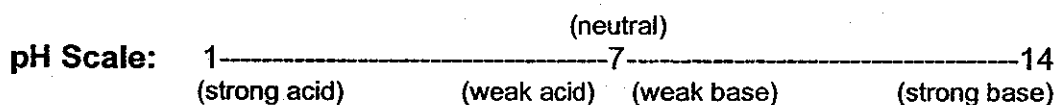
- (1) Place 1-2 drops of phenolphthalein indicator into one microwell.
- (2) Place 1-2 drops of bromothymol blue indicator into one microwell.
- (3) Place one small piece of red litmus paper into one microwell.
- (4) Place one small piece of blue litmus paper into one microwell.
- (5) Add 5 drops of Hydrochloric acid (HCl) into each microwell containing an indicator. Record your results in Table 1.
- (6) Repeat steps 1 – 4
- (7) Add 5 drops of Sodium hydroxide (NaOH) into each microwell containing an indicator. Record your results in Table 1.
- (8) Wash and dry your microplate.

PART 2 : IDENTIFYING UNKNOWN SOLUTIONS

- (1) Place 1-2 drops of phenolphthalein indicator into one microwell.
- (2) Place 1-2 drops of bromothymol blue indicator into one microwell.
- (3) Place one small piece of red litmus paper into one microwell.
- (4) Place one small piece of blue litmus paper into one microwell.
- (5) Add 5 drops of Unknown solution A into each microwell containing an indicator. Record your results in Table 2.
- (6) Repeat steps 1 - 5 for Unknown solutions B – F.
- (7) Wash and dry your microplate.

PART 3 : pH OF HOUSEHOLD SOLUTIONS

pH = unit used to measure the strength of an acid or base



- (1) Label TEN microwells (1 – 10)
- (2) Place 10 drops of each household solution into the appropriate microwell
- (3) Place 1-2 drops of universal indicator into each microwell. Record the results in Table 3.
- (4) Use the Universal Indicator Solution Colour Table to estimate the pH of each household solution. Record your pH estimates in Table 3.
- (5) CLEAN-UP:
 - (a) All wastes can be disposed down the sink with lots of water.
 - (b) Wash and Dry all apparatus
 - (c) Return ALL apparatus and reactants to the supply table
 - (d) Wash and Dry your lab station.

OBSERVATIONS:

TABLE 1. AN ACID AND A BASE

INDICATOR	COLOUR	
	In Acid	In Base
Phenolphthalein		
Bromothymol blue		
Red Litmus Paper		
Blue Litmus Paper		

TABLE 2. IDENTIFYING UNKNOWN SOLUTIONS

UNKNOWN	PHENOLPHTHALEIN	BROMOTHYMOLO BLUE	RED LITMUS	BLUE LITMUS	ACID, BASE, or NEUTRAL?
A					
B					
C					
D					
E					
F					

TABLE 3. pH OF HOUSEHOLD SOLUTIONS

#	SOLUTION NAME	COLOUR	pH	ACID, BASE, OR NEUTRAL ?
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

TABLE 4. UNIVERSAL INDICATOR SOLUTION COLOUR TABLE

COLOUR	pH
Orange-Red	2
Red-Orange	3
Orange	4
Yellow-Orange	5
Orange-Yellow	6
Green-Yellow	7
Green	8
Blue-Green	9
Blue-Violet	9.5
Violet	10
Violet-Red	11
Violet-Red	12

DISCUSSION:

1. (a) Which acid/base indicator do you think is the most useful? Explain.

(b) Which acid/base indicator do you think is the least useful? Explain.

2. (a) List the household liquids that were ACIDIC.

(b) What kind of substances do they tend to be?

3. (a) List the household liquids that were BASIC.

(b) What kind of substances do they tend to be?

4. Why are BASIC compounds so effective as detergents and cleaners? (p. 190)

5. (a) If a piece of red litmus remained red and a piece of blue litmus remained blue in a solution, how would you classify the solution?

(b) If you placed 3-4 drops of Universal Indicator in the solution, what colour would you expect to see? Explain.